

Claims

What is claimed is:

1. A method of synchronizing data comprising:
receiving data from a data repository;
storing the data in a buffer; and
applying rules to the buffer data, the rules specifying criteria for associating the
buffer data with data in a core.

2. A method as recited in claim 1 further comprising:
in response to applying the rules to a buffer object in the buffer data, creating an
associated core object in the core.

3. A method as recited in claim 1 further comprising:
in response to applying the rules to a buffer object in the buffer data, creating an
associated core object in the core; and
joining the core object with the buffer object.

4. A method as recited in claim 1 further comprising:
in response to applying the rules to a buffer object in the buffer data, creating an
associated core object in the core;
joining the core object with the buffer object; and
importing a buffer attribute from the buffer object to the core object.

1 5. A method as recited in claim 1 wherein the rules comprise a schema, the
2 schema comprising:

3 a sub-schema element modeling data types from the data repository.
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5 6. A method as recited in claim 5 wherein the schema further comprises:
6 an attribute-inclusion element comprising one or more attributes to be imported
7 into the core;

8 a projection element specifying criteria for creating a core object related to a
9 buffer object; and

10 a join element specifying criteria related to linking the core object with the buffer
11 object.
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13 7. A method as recited in claim 6 wherein the schema further comprises:
14 a connector-filter element specifying criteria related to preventing linking the core
15 object with the buffer object; and

16 an export-attribute-flow element specifying criteria related to associating an
17 attribute of the core object with the buffer object.
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19 8. A method as recited in claim 6 wherein the schema further comprises:
20 a provisioning-cleanup element specifying an action to take in response to
21 unlinking the core object from the buffer object.
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24 9. A method as recited in claim 6 wherein the schema further comprises:
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an extension element specifying an extension related to an assembly to be employed to carry out one or more of the elements in the schema.

1 10. A method for synchronizing data from a plurality of data repositories
2 comprising:
3 receiving a data set from each of the plurality of data repositories, each data set
4 comprising one or more repository objects, each repository object having one or more
5 repository attributes associated with one of the data repositories;
6 retrieving a plurality of schemas, each schema specifying criteria related to one of
7 the data sets; and
8 aggregating repository objects in an aggregated space based on the data sets and
9 the schema criteria.

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11 11. A method as recited in claim 10 further comprising storing the data sets in
12 a buffer.

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14 12. A method as recited in claim 11 wherein the storing comprises storing
15 each of the data sets in an associated portion of the buffer.

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17 13. A method as recited in claim 10 wherein at least one of the plurality of
18 schemas comprises:
19 a sub-schema element specifying object types and attributes of objects associated
20 with the data repository.

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22 14. A method as recited in claim 13 further comprising retrieving the sub-
23 schema from the associated data repository.
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15. A method as recited in claim 10 wherein at least one of the schemas
comprise:
a projection element specifying criteria for creating an aggregated object in the
aggregated space related to a repository object in the data set associated with the schema;
and
a join element specifying criteria related to linking the aggregated object to the
repository object.

16. A method as recited in claim 10 wherein at least one of the schemas
comprise:
an attribute-inclusion element specifying an attribute to be imported from the
associated data repository into the aggregated space.

17. A method as recited in claim 10 wherein at least one of the schemas
comprise:
an attribute-inclusion element specifying an attribute to be imported from the
associated data repository into the aggregated space; and
an export-attribute-flow element specifying criteria related to associating the
imported attribute with one or more repository objects in one or more of the data sets.

18. A method as recited in claim 10 wherein at least one of the schemas
comprise:
a join element specifying criteria related to linking an aggregated object in the
aggregated space to a repository object in one of the data sets; and

1 a provisioning-cleanup element specifying an action to take in response to
2 unlinking the aggregated object from the repository object.

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4 19. A method as recited in claim 10 wherein the aggregating comprises:
5 associating a first attribute of a first repository object of an object type with an
6 aggregated object in the aggregated space; and
7 associating a second attribute of a second repository object of the object type with
8 the aggregated object.

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1 20. A computer-readable medium comprising a computer-readable schema for
2 use in a metadirectory operable to synchronize a plurality of data repositories, the schema
3 comprising:

4 a schema sub-element associated with one of the plurality of data repositories,
5 wherein the schema sub-element specifies object types associated with objects from the
6 data repository.

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8 21. A computer-readable medium as recited in claim 20, wherein the schema
9 sub-element further specifies attributes associated with objects from the data repository.

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11 22. A computer-readable medium as recited in claim 20, wherein the schema
12 further comprises:

13 a projection element specifying criteria for creating an aggregated object in an
14 aggregated space, the aggregated object related to a repository object from one of the
15 plurality of data repositories; and

16 a join element specifying criteria related to linking the aggregated object to the
17 repository object.

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20 23. A computer-readable medium as recited in claim 20, wherein the schema
21 further comprises:

22 a projection element specifying criteria for creating an aggregated object in an
23 aggregated space, the aggregated object related to a repository object from one of the
24 plurality of data repositories;

1 a join element specifying criteria related to linking the aggregated object to the
2 repository object; and

3 a provisioning-cleanup element specifying an action to take in response to
4 unlinking the aggregated object from the repository object.

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6 23. A computer-readable medium as recited in claim 20, wherein the schema
7 further comprises:

8 a projection element specifying criteria for creating an aggregated object in an
9 aggregated space, the aggregated object related to a repository object from one of the
10 plurality of data repositories;

11 a join element specifying criteria related to linking the aggregated object to the
12 repository object; and

13 a provisioning-cleanup element specifying an action to take in response to
14 unlinking the aggregated object from the repository object.

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16 24. A computer-readable medium as recited in claim 20, wherein the schema
17 further comprises:

18 a projection element specifying criteria for creating an aggregated object in an
19 aggregated space, the aggregated object related to a repository object from one of the
20 plurality of data repositories;

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22 a join element specifying criteria related to linking the aggregated object to the
23 repository object;

24 a provisioning-cleanup element specifying an action to take in response to
25 unlinking the aggregated object from the repository object; and

1 an attribute-inclusion element specifying an attribute of the repository object to be
2 associated with the aggregated object.

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4 25. A computer-readable medium as recited in claim 20, wherein the schema
5 further comprises:

6 a projection element specifying criteria for creating an aggregated object in an
7 aggregated space, the aggregated object related to a repository object from one of the
8 plurality of data repositories;

9 a join element specifying criteria related to linking the aggregated object to the
10 repository object;

11 a provisioning-cleanup element specifying an action to take in response to
12 unlinking the aggregated object from the repository object;

13 an attribute-inclusion element specifying an attribute of the repository object to be
14 associated with the aggregated object; and

15 an export-attribute-flow element specifying criteria related to associating the
16 imported attribute with one or more repository objects.

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18 26. A computer-readable medium as recited in claim 20, wherein the schema
19 further comprises:

20 an element specifying a script.

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23 27. A computer-readable medium as recited in claim 20, wherein the schema
24 further comprises:

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connector-filter criteria specifying one or more repository object types that are not to be linked to an object in the metadirectory.

28. A computer-readable medium as recited in claim 27, wherein the connector-filter criteria comprises:

attribute criteria specifying attribute values associated with object types that are not to be linked to an object in the metadirectory.

29. A computer-readable medium as recited in claim 27, wherein the one or more repository object types are selected from a set of object types comprising:

a contact object type;

a user object type;

an organization object type; and

an organizational unit object type.

1 30. A metadirectory for aggregating data from a plurality of remote
2 repositories comprising:

3 a plurality of management agents, each management agent associated with one of
4 the plurality of remote repositories;

5 a connector space operable to receive data from data from the plurality of
6 management agents; and

7 a synchronization engine operable to aggregate data from the connector space
8 based on declarative rules related to the management agents.

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10 31. A metadirectory as recited in claim 30 wherein the declarative rules
11 comprise a plurality of management agent schemas, each management agent schema
12 associated with one of the management agents.

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14 32. A metadirectory as recited in claim 30 further comprising an aggregated
15 space operable to receive aggregated data from the connector space.

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17 33. A metadirectory as recited in claim 31 wherein each of the plurality of
18 management agents is further operable to retrieve a repository schema from the
19 associated remote repository, the repository schema specifying data object types used by
20 the associated remote repository.

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23 34. A metadirectory as recited in claim 33 wherein each of the repository
24 schemas further specify attributes used by the associated remote repository.

1 35. A metadirectory as recited in claim 31 wherein each of the management
2 agent schemas comprise a repository type element specifying the type of repository
3 associated with the management agent.

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5 36. A metadirectory as recited in claim 35 wherein the repository type element
6 is selected from a set of repository types comprising:

7 an Lightweight Directory Access Protocol repository type;
8 a file repository type; and
9 a database repository type.

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11 37. A metadirectory as recited in claim 36 wherein the repository type element
12 specifies a repository sub-type selected from a set of repository sub-types comprising

13 an Active Directory ® sub-type;
14 a delimited text sub-type;
15 a Structured Query Language (SQL) sub-type; and
16 an Oracle ® sub-type.

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18 38. A metadirectory as recited in claim 30 wherein each of the management
19 agents are further operable to convert data from the associated remote repository into data
20 in an isomorphic form.

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23 39. A metadirectory as recited in claim 31, wherein each of the management
24 agent schemas comprise Extensible Markup Language (XML) elements.

1 40. A metadirectory as recited in claim 30 further comprising a metadirectory
2 schema applicable to all management agents, the metadirectory schema specifying
3 import-attribute-flow rules related to importing attributes from the connector space into
4 an aggregated space.
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